

Length of the Intestinal Canal.

	ft.	in.
Small intestines	8	0
Large ditto	1	5½
Cæcum.....	0	1½

The cæcum is of a conic figure with the fundus constricted. The liver extends from the right hypochondriac to the right lumbar region, and is nearly hidden behind the stomach. The upper surface of the right lobe adhered in this specimen firmly to the corresponding surface of diaphragma; it is of very reduced size. The gall-bladder is of a cylindric, pyriform shape, three-quarters of an inch in length. The spleen is small, triangular, somewhat flattened, measuring one inch in length, and five-eighths in its broadest diameter. The pancreas is linear, flattened, two inches in length, three-sixteenths in diameter.

Costæ veræ seven, spuriaë five = twelve pairs.

XLVI.—*Botanical Notices from Spain.*

By MORITZ WILLKOMM*.

[Continued from p. 270.]

No. XII. GRANADA, August 10, 1845.

SOME miles to the east of Granada lies an extensive mountain tract, consisting of limestone, which bears the name of Montes de Granada, and is formed of several mountain-chains, which have various names, although they constitute one and the same range. The Sierra de Alfacar forms the western limit of the mountains of Granada, with which the Sierra de Jarana lying behind it, about 7000 feet high, runs parallel; this is the highest part of the whole range, and forms its northern limit. With this is connected on the north several lower mountain-ranges, as the Sierra del Rallo and Sierra de las Navas, which divide the provinces of Granada and Jaen; whilst in the south, the Sierra de Jarana and the Sierra de Molinillo, and that of Alfacar pass over into the rocky Sierra de Huétor, both which are separated from the outliers of the Sierra Nevada partly by the valley of the Darro, and partly by the Rio Aucharón. This many-branched mountain district, whose vegetation varies remarkably in its different parts, divides the noble Vega de Granada from the barren and arid high plains of Guadix, and the basin of the Jenil from that of the upper Guadalquivir. I have examined this interesting district in all its parts, during several excursions, and will here endeavour to give in short sketches as true a picture as possible of its rich vegetation.

The greatest part of the whole mountain-chain is quite barren; and in the broad hollow between the Sierra de Alfacar and the first chain of the Sierra de Jarana, as well as in the valleys and ravines

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of the Sierra del Molinillo, are woods, consisting of *Pinus Pinaster*, Ait., *Quercus Ilex*, L., and *Q. lusitanica*, Lamk. *α. faginea*, and under them a luxuriant underwood composed of the shrubs common in the south of Spain, among which I observed in the above-mentioned hollow the beautiful white-blossomed *Cistus laurifolius*, L., and a dwarf rose with small white blossoms in great abundance. The lower part of the western declivity of the Sierra de Alfacar, as well as the northern ridges known by the name of the Sierra del Rallo and de las Navas, are thickly clothed with *Lavandula Spica*, L., which does not occur in the Sierra Nevada even at the same elevation, but is there supplanted by *L. lanata*, Boiss., as well as by various common *Cistineæ*, as *C. albidus*, *C. crispus*, *C. monspeliensis*, *Helianthemum guttatum*, *salicifolium*, *Fumana*, &c. Under shady bushes occur not rarely, throughout the whole range, *Pæonia lobata*, Desf., and *Leuzea conifera*, DC., and on the rocks of all the chains, reaching into the alpine region, a number of the oft already-mentioned rock plants, which are also found in all the mountain-chains of Granada; especially *Barkhausia albida*, Cass., *Saxifraga spathulata*, Desf., *Draba hispanica*, Boiss., *Alyssum alpestre*, L., *Arabis auriculata*, Lam., and many others. On loose rocky soil of the western acclivity of the Sierra de Alfacar occur *Helianthemum origanifolium*, P., *Arenaria Armeriastrum*, Boiss., *Thymus granatensis*, Boiss., *Satureja cuneifolia*, Ten., *Convolvulus lineatus*, L., and on shady rocks of the east side, *Ononis arragonensis*. Also, on loose rocky soil along the crest, *Helianth. piliferum*, Boiss., and *Haenselera granatensis*, Boiss., a beautiful Cichoriaceous plant, hitherto only found by Boissier in the Sierra Nevada at a single locality, and which grows here in great plenty. Under the shrubs on the oft-mentioned broad hollow between the Sierra de Alfacar and Sierra de Jarana, I observed *Geum sylvaticum*, Pourr., and *Polygala rosea*, Desf., in plenty; upon marshy meadows, *Spiræa Filipendula*, L.; and on rivulets in woody dells, isolated shrubs of *Viburnum Lantana*, L.

The Sierra de Jarana consists of two parallel mountain-chains, the western one of which forms lower, unusually steep and strangely shaped rocks, which are characterized by their sterility; the eastern and higher chain rises in gentle slopes and presents a richer vegetation. I here found, among other plants, *Adonis dentata*, Del., *Tragopogon crociflorum*, L., *Scorzonera hispanica*, L., *Jurinea humilis*, DC., *Matthiola varia*, DC., *Ononis arragonensis*, Asso, *Dianthus brachyanthus*, Boiss., *Anthyllis erinacea*, L., *Ptilotrichum spinosum*, Boiss., and very rarely, *Passerina elliptica*, Boiss.

A remarkably varied flora is found on the much lower but very rocky Sierra de Huétor, which I had an opportunity of visiting on the 8th of July, on my journey into the mountains of eastern Andalusia. On the steep rock-walls of this mountain-chain grew luxuriantly *Anthyllis tejedensis*, Boiss., and a pretty orange-flowered *Centaurea* very plentifully; and on sunny rocky soil occurred, from the foot to the summit, the delicate *Paronychia aretioides*, Pourr., *Reseda Gayana*, Boiss., and *Pistorinia hispanica*, DC., which also covers the grassy levels of the summit in company with *Serratula flaves-*

cens, Poir., and other mountain plants. I found rarely in this mountain-chain the beautiful silver-coloured *Pteroccephalus spathulatus*, Boiss. (*Knautia spath.* Lag. gen. et sp.), forming patches, on fallow land *Anagallis verticillata*, All.; and along the road-side and in ditches *Hypericum tomentosum*, L., and the beautiful *Salvia phlomidis*, Asso. Lastly, I gathered in the valleys of the Sierra del Molinillo, whose vegetation agrees on the whole with the already-described Sierra, a very beautiful yellow *Astragalus*, and in clefts of the shady limestone rocks the *Sarcocapnos crassifolius*, DC., forming very brittle beds.

With this mountain district is connected on the east a broad, partly undulating and barren high table-land, which on the south is surrounded by the Sierra Nevada and its branches, on the east by the Sierra de Gor, and on the north by other lower mountain-chains, and in whose soil (which consists of tertiary and diluvial formations) the rivers descending from the Sierra Nevada have worn very peculiarly formed ravines, or deep valleys. This is the Plain of Guadix, which possesses only a scanty but peculiar vegetation. The whole ground is evidently very much charged with salt, which is partly proved by the neighbouring mineral waters of Graëna, and partly by the saline plants which occur. The following plants grow here very plentifully: *Lygeum Spartum*, L., *Peganum Harmala*, L., *Astragalus tumidus*, W. (*Anthyllis tragacanthoides*, Desf.), *Macrochloa tenacissima*, Kth., *Artemisia campestris*, L., *A. Barrelieri*, Boiss., various *Chenopodiaceæ* and *Salsolaceæ*, and on isolated places *Sideritis linearifolia*, Lag., a delicate species with lineal subulate leaves and whitish-yellow flowers. On walls and ditches in the environs of the pleasant town of Guadix, which lies in a wide valley, were at this time in blossom *Ephedra altissima*, Desf., *Lepidium latifolium*, L., *Althæa officinalis*, L., and *Vitex Agnus-castus*, L., in abundance.

Further eastwards, and separated from the Plain of Guadix by the Sierra de Gor, which is extremely poor in plants, but partly covered with fir-trees, is the broad gypsum basin of Baza, in the midst of which rises the Sierra de Baza, a perfectly isolated great rocky mountain, which I regret that I have not been able to visit. The limits of this plain, destitute alike of trees and water, and intersected by a thousand small valleys, are, on the south, the mountain-chains of Lucar and Serón, on the east the chains of Cullar, Oria and Periate, and on the north the lofty chains of Huescar and Cazorla, in which are the sources of the Guadalquivir. The town of Baza lies on the acclivity of a chain of sand-hills, on which *Santolina canescens*, Lag., flowers in great abundance, and near to the river of the same name, on whose sandy banks I gathered, under shrubs of *Tamarix gallica* and oleanders, *Frankenia pulverulenta*, L., and *Cynanchum monspeliacum*, L. As soon as the river is crossed, you enter on the so-called gypsum formation, the shining white ground is covered with a purely saline vegetation. Immense tracts were exclusively covered with *Macrochloa tenacissima*, Kth.; on other localities the flora consisted of a number of interesting plants, as *Lygeum Spartum*, *Obione portulacoides*, Mocq., *Frankenia thymifolia*, Desf.,

Ajuga Pseudo-iva, DC., *Lepidium subulatum*, L., the elegant *Helianthemum squamatum*, P., and the remarkable *Ononis crassifolia*, Duf., and also *Artemisiæ*, *Chenopodiæ*, and *Salsolaceæ*.

The northern and eastern margin of this broad basin, which still belongs to the province of Granada, is formed by the lofty limestone range of the province of Almeria, whose average height is about 6000 feet, and whose branches stretch into the neighbouring kingdom of Murcia. Close to the boundaries of the kingdoms of Granada, Jaen and Murcia, lies the highest point of this many-branched chain, the Sagra de Huescar, nearly 8000 feet high, an immense conical limestone mountain, which is connected by a low thickly-wooded mountain-chain with three lofty limestone chains running west and east, the Sierra de Maria, Sierra de Velez-Blanco, and Sierra de Oria. The most important of these three mountain-chains, in a botanical point of view, is the Sierra de Maria, which, according to the trigonometrical measurement of Clemente, is nearly 7000 feet high; it takes its name from the hamlet of Maria lying at its north-eastern foot, where I staid for a week. This descends, like all mountain-chains going parallel to it, towards the north in steep rocks, and is covered on its northern base with woods of *Pinus Pinaster*, in which *Cistus laurifolius*, L., *Helianthemum halimifolium*, *Arctostaphylos Uva-ursi*, *Salvia officinalis* and other shrubs occur in great profusion. Of herbaceous plants, I found in these woods *Vincetoxicum nigrum*, Schult., *Teucrium Webbianum*, Boiss., *Nepeta Nepetella*, DC., *Rubia Tinctorum*, L., *Bunium Macuca*, Boiss., *Centaurea granatensis*, Boiss., in plenty; more rarely *Telephium Imperati*, L., and *Dictamnus Fraxinella*, L. In the shady rocky valleys of this side, especially in the romantic Barranco Agrio, stretching up into the alpine region, I again met with some alpine trees of the Sierra Nevada, namely *Lonicera arborea*, Boiss., *Sorbus Aria*, L., and *Acer opulifolium*, Vill., under whose shade on moist loose rocky soil *Geranium lucidum*, L., *Smyrniium perfoliatum*, Mill., and other umbelliferous plants, as well as the beautiful *Scopolina atropoides*, Schult., grew in luxuriant profusion. The clefts of the rugged limestone rocks of the alpine region were filled with thick beds of numerous alpine plants; amongst others, the delicate *Stachys circinnata*, L'Hér., *Hypericum Ericoides*, L., just beginning to flower, *Hieracium saxatile*, Vahl., a beautiful and perhaps new *Globularia* with woody stem and coriaceous, stiff, thorny-serrate leaves, an *Arenaria* with elliptical, grayish-green, almost succulent leaves and large white flowers, forming much interlaced and fragile patches, a stemless, white, woolly *Centaurea* with orange-coloured flowers, a *Silene*, and many others; and at the foot of the same rocks I observed *Senecio quinqueradiatus*, Boiss., *Rumex pulcher*, L., and the beautiful *Andryala Agardhii*, Boiss., in full flower. In shady clefts of the highest rocks I found *Erinus alpinus*, L., *Ptilotrichum longicaule*, Boiss., and a splendid *Saxifraga*, growing in most luxuriant beds, with large blossoms and succulent, serrate, viscous leaves; also on the highest ridges *Erodium trichomanefolium*, L'Hér., *Anthyllis Webbiana*, Hook., *Sideritis scordioides*, L., var. *vestita*, Boiss., *Arenaria tetraquetra*, L., and a number of alpine shrubs, as *Ptilotri-*

chum spinosum, Boiss., here constantly with white flowers; *Anthyllis Erinacea*, L., *Vella spinosa*, Boiss., *Genista aspalathoides*, DC., var. *confertior*, Boiss., and *Juniperus phænicea*, L. On loose rocky soil and fields at the foot of the mountain-chain I remarked *Minuartia campestris*, Löffl., in plenty, *Lagæcia cuminoides*, L., *Polygonum Convolvulus*, L., and various grasses. Almost the same, but a much poorer vegetation is found on the lower Sierra de Oria.

Between Maria and the lofty Sagra de Huescar, which I ascended on the 15th of June, is a wide, undulating, high table-land, destitute of water and trees, which presents only a few plants. I however gathered some rather scarce plants here in plenty, as the pretty *Jurinea pinnata*, DC. (*Stæhelina*, Lag.), *Thymus membranaceus*, Boiss., *Allium sphærocephalum*, L., a pretty *Onobrychis* and a beautiful large-blossomed *Lavatera*. Some low mountain-ridges, almost wholly covered with *Lavandula Spica*, have to be traversed before reaching the foot of the Sagra, on which lies the large hamlet of La Puebla de Don Fabrique, in whose neighbourhood occurs *Santolina pectinata* in plenty, and distant several miles from the Sagra, on which some fields of snow were still visible. This colossal mountain is on its southern and western acclivity up to half its height thickly wooded with firs, in whose shade I met with a pretty little *Campanula* on the loose vegetable soil. The whole of the upper portion of the mountain is entirely barren, and covered on almost all sides with loose limestone debris. The summit is formed of a narrow, grassy level, on which the remarkable rose-red *Senecio Boissieri*, DC., flowers in company with a *Paronychia*, *Anthyllis Webbiana*, Hook., and *Galium pyrenaicum*, Gou. On the rocks of the northern acclivity below the summit I gathered a small *Saxifraga* with *Valeriana tuberosa*, DC.; and upon barren limestone debris, almost wholly concealed among the loose stones, here and on the western acclivity, two peculiar plants in great profusion, namely a *Platycapnos* with nearly round heads of small flesh-coloured flowers and finely divided, grayish-green leaves, and a pretty stemless Cichoriaceous plant with almost spatulate long petiolated leaves, covered on both sides with a white wool, and a long-stalked head of large blossoms of yellow flowers, on the underside of a carmine colour. On the debris of the southern acclivity occur the pretty *Scutellaria orientalis*, L., more frequent *Ptilotrichum spinosum*, *Vella spinosa*, *Anthyllis Erinacea*, and *Andryala Agardhii*.

About six miles east of Maria and a mile from Velez-Blanco rises a remarkable rugged mountain somewhat of the form of the Lilienstein in the Saxon Switzerland, which has the name of Muela de Montalbiche, and may be about 5000 feet high. This immense limestone rock forms the highest point and the most western abutment of a chain, the greatest part of which belongs to the kingdom of Murcia, and is only accessible from the western side. I ascended it on the 19th of July, and found here in the rocky clefts from the foot to the summit the elegant *Hypericum ericoides*, L., in great plenty; and moreover on the shady rocky walls of the upper part a small, half-shrubby, fragile, whitish-gray *Teucrium* forming patches,

together with *Sarcocapnos enneaphyllos*, DC., but rather scattered. Upon loose rocky soil on the acclivities of the mountain grew luxuriantly *Thymus membranaceus*, Boiss., and *Lavandula Spica*, L.; and on the extensive surface of the summit *Cerasus prostrata*, DC. Between the two mountain-chains of Velez-Blanco and Oria is a broad, barren and arid table-land, which descends toward the west into the gypsum basin of Baza, toward the east into the wide and fruitful valley of the Rio de Velez, and contains some miserable hamlets, affording scarcely the barest nourishment. Few plants are found in this country; but here grow luxuriantly *Centaurea granatensis*, Boiss., *Euphorbia serrata*, L., a *Barkhausia*, *Convolvulus lineatus*, L., *Thymus longiflorus*, Boiss., and especially the rare *Sideritis foetens*, Clem. in Lag. gen. and sp., somewhat frequent.

After crossing the Sierra de las Estancias, which presents a merely rocky and barren crest, a branch of the chain of Oria, and which runs east and west, forming the right wall of the valley of the river of Velez-Rubio, the ground sinks gradually more and more down toward the coast, which however is still above eight leagues distant. The whole of this south-eastern part of the province of Almeria, watered throughout by the Rio de Almanzora, is distinguished by its extreme barrenness, and the valleys alone yield the botanist any hopes of booty. Through the Rambla de las Carrascas, a valley now quite destitute of water, whose sides are covered in parts with vines, olives and fig-trees, I reached, near the little town of Huercal-Overa, the valley of the Almanzora, which is in summer only an insignificant rivulet. Huercal-Overa lies close to the northern foot of the bleak Sierra de Almagro, whose most western and lowest portion is intersected by the river. The mountain-chain consists of limestone, and appears to be very barren. Close behind the above-named little town, you enter the narrow, very rocky and picturesque valley, which is in parts well-cultivated. On sunny rocks I remarked here the rare *Lavandula dentata*, L., but already off flower, as well as a shrubby *Galium*, and on sand-hills the pretty *Brassica pendula*, Boiss. (*Sisymbrium pend.*, Desf.), in company with *Moricandia arvensis*, DC. Before reaching the little town of Cuevas-Overa, the river leaves the mountain-chain and hastens in numerous windings through a wide, flat and extremely beautiful valley toward the sea, which is distant scarcely four miles from Cuevas. The environs of Cuevas-Overa consist for the most part of gypsum, and have therefore, excepting some salt-plants, only a very poor vegetation. On the gypsum-hills, west of the town, there grows luxuriantly *Santolina viscida*, Lag., frequent; *Atractylis humilis*, L., occurs rare; whilst *Paliurus australis*, L., which I have followed up to the limits of Murcia and high up in the valley of the Almanzora, is very common in the whole country round. Six miles east of Cuevas, on the frontiers of Andalusia and Murcia, rises the Sierra Almagrera, which has latterly become so famous for its rich silver-mines—a mountain-range, scarcely 3000 feet in height, consisting of graywacke and clay-slate, the most eastern point of Andalusia. The vegetation of this chain, which I visited on the 21st of July, reduces itself to a small number of salt-plants,

as *Frankenia thymifolia*, Desf., which overgrows a great part of the Sierra, two species of *Salsola*, a *Statice*, *Artemisia campestris* and *A. Barrelieri*, &c. *Paliurus australis*, already mentioned, is also found throughout the chain in great plenty.

Through the centre of the province of Almeria runs a broad, lofty mountain-chain, the chief direction of which lies from N.W. to S.E., separating the two wide valleys of the Rio de Almanzora and the Rio de Almeria. The first of these rivers divides this mountain-chain from those of Seron, Lucar, Oria, and the frontier chains of Murcia; the other, on the contrary, from the Sierra de Gador and the eastern part of the Sierra Nevada. The chief portion of this range is formed by the Sierra de Filabres, which consists of the same gneiss that composes the lofty mountain-range of the Sierra Nevada, and is separated by a high plain from the Sierra de Aljamilla, which probably consists of limestone, and terminates in the immense porphyry rocks of the Cabo de Gata. I traversed the highest part of the Sierra de Filabres on my way back from Cuevas to Granada, after I had gone up the valley of the Almanzora as far as the little town of Purchena, where *Statice globulariæfolia*, Desf., occurs in great plenty. The Sierra de Filabres, whose highest point is the Teta de Vacares, rising nearly 7000 feet, forms broad, gently rounded summits; but it does not appear to be very rich in plants. It however possesses many plants which had hitherto only been met with in the Sierra Nevada, as *Adenocarpus decorticans*, Boiss., *Lavandula lanata*, Boiss., and others; also *Teucrium capitatum*, L., *Satureja montana*, L., *Thymus hirtus*, W., *Scabiosa tomentosa*, Cav., *Onopordon acaule*, L., *Cirsium flavispina*, Boiss., *Marrubium sericeum*, Boiss., *Bupleurum spinosum*, L., *Berberis vulgaris* var. *australis*, and on the summits the common alpine shrubs, *Ptilotrichum spinosum* and *Anthyllis Erinacea*.

Between the valley of the Rio de Almeria and the Plain of Guadix lies a gently sloped range of hills, which connects the Sierra Nevada with the Sierra de Gor, and belongs to the district of El Marquesado, by which name the plain along the north-eastern foot of the Sierra Nevada is known. This broad ridge is almost destitute of vegetation, but it has one rare plant, *Eurotia ceratoides*, C. A. M., which occurs here in great plenty.

After my return to Granada, I made the last excursion to the Sierra Nevada, at the beginning of this month, in which I again penetrated to the Corral de Veleta, and a second time ascended the Picacho de Veleta. The visit to the Corral was, from the immense masses of snow, under the icy covering of which the swollen alpine streams poured down, accompanied with some danger, but it repaid the risk and toil. Beside a great number of the plants I had gathered in the snow-region the previous year, I brought back from these two excursions some also which I had not before found, as for instance *Dianthus lusitanicus*, Brot., which occurs very plentifully on the gneiss rocks of the Barranco de Gualnon, *Aretia Vitaliana*, L., *Senecio Boissieri*, DC., *Cirsium odontolepis*, Boiss., *Sedum anglicum*, L., var. *rivulare*, Boiss.; and from the highest summit of the

Picacho de Veleta some specimens of the extremely rare *Linaria glacialis*, Boiss., and several grasses, among others *Trisetum glaciale*, Boiss., and *Festuca Clementei*, Boiss.

BIBLIOGRAPHICAL NOTICES.

A History of the Fossil Insects of the Secondary Rocks of England.

By the Rev. P. B. BRODIE, M.A., F.G.S. London, 1845. 8vo.

A REMARKABLE proof is afforded by the present work of the mode in which geology calls in to its assistance the different natural sciences. Few would have supposed that entomology could have been made to perform its part in the elucidation of the ancient physical history of our planet, but here we have a work presented to us in which beautiful representations, from the pencil of Mr. Westwood, of very many fossil insects are contained. Portions of nearly all the orders have been found. By far the greater number of the specimens consist of the wings and elytra only, but in some instances, especially amongst the *Diptera*, the insect is presented to us in a nearly perfect state.

The fossils are derived from several strata. The first locality noticed by the author is in the Purbeck strata in the Vale of Wardour in Wiltshire. He there finds very numerous specimens and species, chiefly however confined to a thin bed of limestone. He remarks that "the remains of insects are so abundant, and present such a variety of genera, that we are in this instance forcibly reminded of the rich collection of these beautiful fossils in the more modern deposits of Aix and Cœningen." The *Coleoptera* seem to have been abundant, but very few perfect beetles were found, single elytra being of most frequent occurrence. Amongst them are species both terrestrial and aquatic, herbivorous and carnivorous, of the families *Buprestidæ*, *Carabidæ*, *Curculionidæ*, *Chrysomelidæ*, *Elateridæ*, *Cantharidæ*, *Tenebrionidæ* and *Helophoridæ*. Of the other orders, specimens of *Orthoptera*, *Neuroptera*, *Hemiptera* and *Diptera* occur. We would more especially mention a nearly perfect *Acheta* and very numerous *Tipulidæ*.

We are next introduced to a few imperfect specimens, but apparently belonging to several genera from the Stonesfield slate in Gloucestershire, a numerous list of the other fossils from which is given. A few also occur in the Oxford clay and forest marble, which, together with the Stonesfield slate, are the only strata between the Purbeck and lias rocks in which remains of insects have been discovered in England.

In part of the lower lias of Gloucestershire, a few thin beds of limestone are found to be richly stored with fossil insects; "the total number of specimens submitted to Mr. Westwood amounts to 300." He detected many *Coleoptera* of the families *Buprestidæ*, *Elateridæ*, *Curculionidæ*, *Chrysomelidæ*, *Carabidæ*, *Telephoridæ*, *Dytiscidæ*, *Gyrinidæ* and *Melolonthidæ*; also *Orthoptera*, *Hemiptera*, *Homoptera*, *Neuroptera* (including several beautiful dragon-flies), and one species of *Diptera*.